Background: The arid and nutrient-poor Southwestern Australia is one of the global biodiversity hotspots. Embedded in this landscape, granite outcrops are considered terrestrial insular habitats supporting habitat heterogeneity when compared to the more homogenous surrounds. Ecology of plant species and communities on granite outcrops has been addressed in numerous studies. However, functional diversity (FD) in context of the environmental heterogeneity remained unexplored.

Aims: We tested whether mesic deep-soil habitats on granite outcrops can sustain larger FD than dry shallow-soil habitats.

Methods: We calculated FD for dominant species for five single traits (leaf dry matter content, foliar ?13C, foliar C:N ratio, plant height and specific leaf area) and their combinations. We employed Generalized Additive Mixed Models to quantify the relationship between selected climate and soil depth variables, and FD.

Results: More benign (deep-soil) habitats supported larger FD for foliar C:N, plant height and for multiple traits than did shallow-soil habitats.

Conclusions: We suggest that: (1) functional diversification, likely aimed at avoiding intra- and interspecific competition for light and nutrients acquisition, might be the important factor in deep-soil habitats; (2) deep-soils patches on and around granite outcrops may serve as ecological microrefugia for biota associated with resource-rich environments.